

REMARKS

Claims 1-60 are pending in the present application. Claims 47-60 were withdrawn from consideration. In the Office Action mailed on June 12, 2006, the Examiner took the following action: (1) objected to the drawings as failing to comply with 37 CFR 1.84(p)(5) because they include reference characters not mentioned in the description; (2) objected to the specification because of informalities; (3) rejected claims 4-6 and 8-10 under 35 U.S.C. §102(b) as being anticipated by Blohowiak (U.S. 5,869,141); (4) rejected claims 7 and 11-13 under 35 U.S.C. §103(a) as unpatentable over Blohowiak; (5) rejected claims 1-3 under 35 U.S.C. 103(a) as unpatentable over Vaughan (U.S. 3,967,091) in view of Grylls (U.S. 2002/0192496A1) and in further view of Konieczny (U.S. 6,769,956); (6) rejected claim 14 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Hess (U.S. 4,373,968); (7) rejected claim 15 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of the Tomadol Data Sheet, "Tomadol", (<http://www.tomah3.com/products/prodImages/TomadolDatasheet.pdf>); (8) rejected claims 18-19 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Montana (U.S. 6,616,976); (9) rejected claims 20-21 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Tola (U.S. 5,049,232); (10) rejected claim 22 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Shimizu (U.S. 4,374,890); (11) rejected claim 23 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Shimizu, and in further view of Poutasse (U.S. 5,629,098); (12) rejected claims 24-25 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Vaughan, and in further view of Grylls; (13) rejected claims 26-34 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Konieczny; (14) rejected claim 35 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Hess; (15) rejected claim 36 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Grylls, Vaughan, Konieczny, Sagiv, and Tomadol; (16) rejected claims 37-38 under 35 U.S.C.

§103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Montana; (17) rejected claim 41 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Shimizu; (18) rejected claim 42 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, Vaughan, Konieczny, Shimizu, and Poutasse; (19) rejected claims 43-44 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Shimizu; (20) rejected claim 45 under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Shimizu. Applicants hereby amend claims 4, 16, 23, 41, 43, and 45, cancel claims 22 and 46, and add claims 61-62. Applicants respectfully request reconsideration of the application in view of the foregoing amendments and the following remarks.

I. Objection to the drawings

The Examiners objected to the drawings as failing to comply with 37 CFR 1.84(p)(5) because they include reference character(s) not mentioned in the description. Specifically, The Examiner states that reference characters "80" and "86" of Figure 3 are not mentioned in the specification. Applicants respectfully submit that reference character "86" is mentioned on page 6, partial paragraph 1 of the applicants' specification. The last sentence of partial paragraph 1 on page 6 (which continues from page 5) of the applicants' specification states, "Heated air is supplied to the oven 75 (currently amended to 92) through inlet duct 72 and the solvent vapors exits through exhaust duct 86." However, applicants have deleted reference character "80" from Figure 3 to correct the informality noted by the Examiner. Replacement drawings are hereby submitted. Therefore, applicants respectfully request reconsideration and withdrawal of these objections.

II. Objection to the Specification

The Examiner objected to the specification because on page 3 of the specification it states, "an adhesive coating line 70 (Fig.3)". The Examiner states that it should read "an adhesive coating line 100 (Fig. 3)." Applicants have made appropriate amendments to the specification to correct the informality noted by the Examiner, and respectfully request reconsideration and withdrawal of this objection.

III. Rejection under 35 U.S.C. §112

Claims 22-23, 41, 43, and 45 are rejected under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants have canceled claim 22 and amended claim 23 to depend from claim 16. Moreover, Applicants have amended claim 41, 43, and 45 to recite an epoxy material comprising about 3-35% by wt. *liquid* diglycidylether of bisphenol-A, about 35-60% by wt. *solid* diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber. Further, claim 46 is also rejected under 35 U.S.C. §112, second paragraph, for reciting a limitation with insufficient antecedent basis. Applicants have canceled claim 46. Therefore, applicants submit that claims 23, 41, 43, and 45 are now enabled and sufficiently definite, and respectfully request reconsideration and withdrawal of the rejections of these claims.

IV. Rejections under 35 U.S.C. §102(a)

Claims 4-6, 8-10, and 16-17 were rejected under 35 U.S.C. §102(b) as being anticipated by Blohowiak. Respectfully, applicants traverse the rejections, and submit the claims are allowable over the cited reference to Blohowiak for the reasons explained in detail below.

Blohowiak (U.S. 5,869,141)

Blohowiak teaches a surface treatment, especially for titanium and aluminum alloys, that forms a sol-gel film covalently bonded on the metal surface to produce strong, durable adhesive bonds between the metal and organic adhesive without using toxic chemicals. (2:62-3:31). This significantly reduces or eliminates the rinse water requirements of traditional anodizing or etching processes. (1:28-45).

Claims 4-6 and 8-10

Claims 5-6 and 8-10 depend from claim 4. Claim 4, as amended, recites a continuous process for applying a sol-gel coating to a metal material and an adhesive coating onto the sol-gel coating, comprising: subjecting the metal material to a caustic solution of sodium hydroxide; rinsing the metal material with water to remove the caustic solution of sodium hydroxide from the metal material; applying a sol-gel coating to the metal material; evaporating the water portion of the sol-gel coating; and applying a liquid adhesive coating to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating.

Applicants respectfully submit that the cited reference to Blohowiak does not teach the continuous process for applying a sol-gel coating and an adhesive coating onto a sol-gel coating, comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material, *wherein the liquid adhesive coating is an epoxy-based adhesive coating including an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18%*

by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating.” (emphasis added). Instead, Blohowiak only teaches a surface treatment for metals that involves forming an adhesive lap joint using BMS 5-101 Type II Grade (Dexter-Hysol EA 9628) epoxy adhesive. (6:32-35).

Accordingly, applicants respectfully submit that the cited reference to Blohowiak does not teach the process recited in claim 4. Thus, claim 4 is allowable over Blohowiak. Furthermore, because claims 5-6 and 8-10 depend from claim 4, they are also allowable over the cited reference to Blohowiak for at least the same reason claim 4 is allowable, as well as for additional limitations recited in those claims.

Claims 16-17

Claim 17 depends from claim 16. Claim 16, as amended, recites a continuous process for applying an adhesive coating onto a sol-gel coating on a metal material, the process comprising: applying a liquid adhesive coating to the sol-gel coating on the metal material, wherein the liquid adhesive coating is an epoxy-based adhesive coating including an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating.

Applicants hereby respectfully incorporate the argument present above in response to the rejection of claim 4 under 35 U.S.C. §102(a). Accordingly, applicants respectfully submit that the cited reference to Blohowiak also does not teach a continuous process for applying an

adhesive coating onto a sol-gel coating on metal material, comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material, *wherein the liquid adhesive coating is an epoxy-based adhesive coating including an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octoate*; and evaporating the solvent portion of the adhesive coating." (emphasis added). Instead, Blohowiak only teaches a surface treatment for metals that involves forming an adhesive lap joint using BMS 5-101 Type II Grade (Dexter-Hysol EA 9628) epoxy adhesive. (6:32-35).

Accordingly, applicants respectfully submit that the cited reference to Blohowiak does not teach the process recited in claim 16. Thus, claim 16 is allowable over Blohowiak. Furthermore, because claim 17 depends from claim 16, it is also allowable over the Blohowiak for at least the same reason claim 16 is allowable, as well as for additional limitations recited in those claims.

V. Rejections under 35 U.S.C. §103(a)

Claims 7 and 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak; claims 1-3 are rejected under 35 U.S.C. 103(a) as unpatentable over Vaughan in view of Grylls, and in further view of Konieczny; claim 14 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Hess; claims 15 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Tomadol; claim 16 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak; claims 18-19 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Blohowiak and Montana; claims 20-21 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Tola; claim 22 is rejected

under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Shimizu; claim 23 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Shimizu, and in further view of Poutasse; claims 24-25 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Vaughan, and in further view of Grylls; claims 26-34 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Konieczny; claim 35 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Hess; claim 36 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, Sagiv, and Tomadol; claims 37-38 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Montana; claims 39-40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Tola; claim 41 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Shimizu; claim 42 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, Shimizu, and Poutasse; claims 43-44 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, and Shimizu; claim 45 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Shimizu. Respectfully, applicants traverse these rejections, and submit that the claims are allowable over the references cited for the reasons explained in detail below.

Vaughan (U.S. 3,967,091)

Vaughan teaches the production of structurally stronger titanium article by a welding bonding technique comprising fastening at least two plates of titanium together using spot-

welding and applying a bead of adhesive along the edge of the resistance spot-welded joint which, upon heating, flows and fills the separation between the joint components. (1:49-56).

Grylls (U.S. 2002/0192496)

Grylls teaches a method for producing a turbine airfoil that is coated with a beta phase, high aluminum content coating, such as substantially stoichiometric NiAl, and which has a surface finish suitable for application of a ceramic topcoat. (Paragraph 15).

Konieczny (U.S. 6,769,956)

Konieczny teaches an apparatus and method for precisely aligning a grit blasting nozzle. The invention includes a movable bracket, a nozzle dimensioned and configured for rapid, precise installation within the movable bracket, and may also optionally include a fixed bracket with at least one proximity sensor. (3:11-20).

Claims 1-3

Claims 1-3 are rejected under 35 U.S.C. 103(a) as unpatentable over Vaughan in view of Grylls and in further view Konieczny. Claims 2-3 depend from claim 1. Claim 1 recites a continuous process for removing oxides from a metal material, comprising: grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320; and rinsing the metal material with water to remove the grit.

Applicants respectfully assert that the cited references (Vaughan, Grylls, and Konieczny), whether individually or in combination, does not disclose, teach or fairly suggest every aspect of claim 1. Specifically, Vaughan does not disclose a continuous process for removing oxides from a metal material, comprising, "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air andter, *wherein the grit has a mesh size of about 180-320.*" (emphasis

added). As noted by the examiner, Vaughan merely teaches a method of weld-bonding that includes grit blasting a titanium alloy with 50 micron alumina.

The deficiencies in the teaching of Vaughan are not remedied by the teachings and disclosures of Grylls. Instead of teaching the grit blasting the *metal material* as recited in claim 1, Grylls teaches a method for producing a turbine airfoil that is coated NiAl that involves grit blasting the *NiAl coating*. Specifically, Grylls teaches that the stoichiometric NiAl coating has a *brittle surface*, and the grit blasting is one of the several effective methods “for improving the surface finish of the coating by reducing the surface roughness which do not adversely impact the *brittle* stoichiometric NiAl coating.” (Paragraph 20). Moreover, Grylls’ specification further teaches that in the grit blasting processes, “Both the particle sizes and the pressure used to impinge the particles on the surface must be carefully controlled to prevent chipping of the *brittle surface*.” (Paragraph 22). In contrast, in the process recited in claim 1, the grit that has a mesh size of about 180-320 is used for grit blasting the *metal material*, not a *brittle surface coating* on the metal material.

Furthermore, the deficiencies in the teachings of Vaughan and Grylls are not remedied by the teachings or disclosures of Konieczny. As noted by the examiner, Konieczny merely teaches that grit blasting involves directing particles against the surface to be grit-blasted by compressed air or fluid such as water, and that grit blasting may be used to create a roughed surface. (1:12-24).

Konieczny does not specifically teach a continuous process for removing oxides from a metal material, as recited in claim 1, where the grit has a mesh size of about 180-320. The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation. *Elan Pharm., Inc. v. Mayo Foundation for Medical and Education Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003). MPEP § 2121.01. Here, the specification of Konieczny only generally states that mesh

size of the grit controls the surface roughness, but does not specifically teach a grit size. (1:20-21). Accordingly, the specification of Konieczny is insufficient to disclose, teach or fairly suggest a continuous process for removing oxides from a metal material, as recited in claim 1, wherein the grit blasting material has a specific mesh size of 180-320.

Therefore, claim 1 is not rendered unpatentable by the reference cited (Vaughan, Konieczny, and Grylls), and is thus allowable. Furthermore, because claims 2-3 depend from claim 1, they are also allowable over the references cited for at least the same reason that claim 1 is allowable, as well as for additional limitations recited in those claims.

Claims 7 and 11-13

Claims 7 and 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak. Claims 7 and 11-13 depend from claim 4. Claim 4, as amended, recites a continuous process for applying a sol-gel coating to a metal material and an adhesive coating onto the sol-gel coating, comprising: subjecting the metal material to a caustic solution of sodium hydroxide; rinsing the metal material with water to remove the caustic solution of sodium hydroxide from the metal material; applying a sol-gel coating to the metal material; evaporating the water portion of the sol-gel coating; and applying a liquid adhesive coating to the sol-gel coating on the metal material *wherein the liquid adhesive coating is an epoxy-based adhesive coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating.* (emphasis added).

Applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 4 under 35 U.S.C. 102(a). Accordingly, applicants once again submit

that Blohowiak does not teach the liquid adhesive recited in claim 4. Instead, Blohowiak only teaches a surface treatment for metals that involves forming an adhesive lap joint using BMS 5-101 Type II Grade (Dexter-Hysol EA 9628) epoxy adhesive. (6:32-35). Therefore, applicants respectfully reassert that claim 4 is patentable over the cited reference to Blohowiak. Further, because claims 7 and 11-13 depend from claim 4, they are allowable over the cited reference to Blohowiak at least due to their dependency, as well as due to additional limitations in each of the claims.

Hess (U.S. 4,373,968)

Hess teaches a coating composition that is effective in forming on a metallic surface a corrosion-resistant coating which comprises an acidic aqueous coating solution containing hexavalent chromium, reduced chromium and dispersed acrylic resin solids. (2:47-52).

Claim 14

Claim 14 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Hess. Claim 14 depends from claim 4. Accordingly, applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 4 under 35 U.S.C. §102(a). Moreover, the deficiencies of Blohowiak are not remedied by the teachings and disclosures of Hess. As noted by the examiner, Hess merely teaches the use of Antarox BL-240 as a surfactant. Thus, claim 14 is allowable for the at least the same reason that claim 4 is allowable.

Moreover, claim 14 is also patentable over Blohowiak in view of Hess because there is no suggestion or motivation to combine the teachings of Blohowiak with the teachings of Hess. As a result, Blohowiak and Hess cannot be combined to teach the process of claim 14, comprising, "apply a sol-gel coating to the metal material, wherein sol-gel is a mixture of zirconium n-propoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and wherein the

surfactant is *Antarox BL-240*.” (emphasis added). To establish a prima facie case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation to modify the reference or combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art references must teach or suggest all claim limitations. MPEP §2143. Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP §2143. The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 N.5, 229 USPQ 182, 187, n.5 (Fed. Cir. 1986). MPEP §2141. Blohowiak teaches that the use of surfactants in a sol solution “to improve the spray characteristics of the solution,” resulting in a more uniform sprayed coating that improves the manufacturability of the process. (15:60-62). In contrast, Hess only teaches the use of surfactants, such as *Antarox BL-240*, in its coating composition to prevent the excessive wear of the applicator rolls and small bits of rubber being deposited on the strips of metal being coated. (7:50-59). Because Blohowiak and Hess teach the use of surfactants for different and unrelated purposes, there is no motivation or suggestion in either of the prior art to combine the *Antarox BL-240* of Hess with the Sol solution of Blohowiak. Therefore, claim 14 is further allowable because Blohowiak and Hess cannot be combined to teach every aspect of the claim.

Claim 15

Claim 15 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Sagiv, and in further view of Tomadol. Claim 15 depends from claim 4. Accordingly, applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 4 under 35 U.S.C. 102(a). Moreover, the deficiencies of Blohowiak are not remedied by the teachings and disclosures of Sagiv and Tomadol. As noted by the Examiner, Sagiv only teaches that a surfactant may be added to a coating composition to aid in leveling of the

composition. Further, the Tomadol Data Sheet, or "Tomadol", merely indicates that Tomadol is a type of ethoxylated linear alcohol nonionic surfactant. Thus, claim 14 is allowable for the at least the same reason that claim 4 is allowable.

Moreover, claim 15 is also patentable over the cited references (Blohowiak, Sagiv and Tomadol) because there is no suggestion or motivation to combine the teachings of Blohowiak with the teachings of Sagiv and Tomadol. As a result, Blohowiak, Sagiv and Tomadol cannot be combined to teach the process of claim 14, comprising, "apply a sol-gel coating to the metal material, wherein sol-gel is a mixture of zirconium n-propoxide, 3-glycidoxypolytrimethoxysilane, glacial acetic acid, and wherein the surfactant is *Tomadol 91-8*." (emphasis added). As stated above, to establish a prima facie case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation to modify the reference or combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art references must teach or suggest all claim limitations. MPEP §2143. Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP §2143. The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 N.5, 229 USPQ 182, 187, n.5 (Fed. Cir. 1986). MPEP §2141.

Blohowiak teaches that the use of surfactants in a *sol solution* "to improve the spray characteristics of the solution." (15:60-62). Blohowiak further teaches that the sol solution contains *organometallic* coupling agents. (2:23-25). In contrast, Sagiv teaches that use of "modified alcohol ethoxylate" surfactants, such as Tomadol, in a composition of aqueous *polyurethane* to aid the leveling of the composition on a substrate as it is applied. (Paragraph 30). Sagiv further teaches that the polyurethane composition comprises: (1) an aqueous *polyurethane* dispersion; and (2) an aqueous *aliphatic polyurethane* dispersion. (Paragraphs 24 and 25). One

ordinarily skilled in the art would recognize that the organometallic sol-gel of Blohowiak and the polyurethane composition of Sagiv have different chemical properties. Moreover, there is no teaching or suggestion in either Blohowiak or Sagiv that an ethoxylated alcohol surfactant that levels a *polyurethane* composition will also improve the spray characteristics of a chemically different *organometallic* sol-gel composition. Consequently, based on the cited prior art references and without the benefit of the applicants' disclosure, one ordinarily skilled in the art would have no reasonable expectation of success. Therefore, claim 15 is further allowable over the cited references (Blohowiak, Sagiv, and Tomadol) because the cited references cannot be combined to teach every aspect of the claim.

Montano (U.S. 6,616,976)

Montano teaches a process and composition for improving the adhesion between a metal surface and a polymeric material by treating the metal surface with an adhesion promotion composition followed by contacting the treated metal surface with an epoxy resin composition. (5:5-10). The process and composition facilitate the production of circuit boards for electronic devices without concern that the polymeric material may delaminate or peel from the metal surface. (5:20-26).

Claims 18-19

Claims 18-19 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Blohowiak, and in further view of Montano. Claims 18-19 depends from claim 16. Accordingly, applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 16 under 35 U.S.C. §102(a). Moreover, the deficiencies in the teachings of Blohowiak are not remedied by the teachings and disclosures of Montano. As noted by the Examiner, Montano merely teaches that an epoxy resin composition can be applied to a metal by spray coating, dip coating, roller coating, or any suitable method to apply an epoxy

resin. (9:41-46). Montano does not teach the specific epoxy-based adhesive coating, as recited in claim 16, comprising an epoxy material and a second curative material. Thus, claims 18-19 are allowable for the at least the same reason that claim 16 is allowable.

Moreover, claim 18 is also patentable over the cited references (Blohowiak and Montano) because the cited references, whether individually or in combination, does not teach a continuous process as recited in claim 18, comprising, “applying a liquid adhesive coating to the *sol-gel coating* on the metal surface, wherein the liquid adhesive is applied in a dip-coating tank.” Instead, Montano merely teaches the dip-coating application of epoxy resin to the *metal* itself. The relevant section of Montano teaches that, “After the metal surface is treated with the adhesive promoting composition, the *metal* is spray-coated, dip-coated, or roller-coated with epoxy resin composition...the methods and apparatus for applying the epoxy resin to the *metal surface* may be horizontal or vertical.” (9:41-46). Therefore, claim 18 is further allowable over the cited references (Blohowiak and Montano).

Likewise, claim 19 is also patentable over the cited references (Blohowiak and Montano) because the cited references, whether individually or in combination, does not teach a continuous process as recited in claim 19, comprising, “applying a liquid adhesive coating to the *sol-gel coating* on the metal surface, wherein the liquid adhesive is applied by spraying.” The relevant section of Montano, as discussed above, merely teaches the spraying application of the epoxy resin to the metal itself. Therefore, claim 19 is further allowable over the cited references (Blohowiak and Montano).

Tola (U.S. 5,049,232)

Tola teaches a method of making a plurality of separate pressure transducers of the type comprising a strain gauge circuit bonded to a diaphragm, comprising the steps of providing an array of a plurality of strain gauge circuits formed on a laminated sheet and an array of a plurality of diaphragms corresponding to the array of the strain gauge circuits. (1:29-55).

Claims 20-21

Claims 20-21 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Tola. Claims 20 and 21 depend from claim 16. Accordingly, applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 16 under 35 U.S.C. §102(a). Moreover, the deficiencies in the teachings of Blohowiak are not remedied by the teachings and disclosures of Tola. First, Tola is not analogous prior art and therefore cannot be combined with Blohowiak to render claims 20-21 unpatentable. In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of the applicant's endeavor, or if not, then be reasonably pertinent to the particular problem with which the invention was concerned. *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USP2d 1767 (Fed. Cir. 1993). MPEP §2141.01(a). Applicants' invention is directed toward the pre-bonding surface treatment of metal to facilitate durable bonds for use in aircraft, aerospace and other applications. On the other hand, Tola teaches the formation of foil/dielectric laminates for the manufacturer of diaphragm-type transducers. (1:29-31). Thus, one ordinarily skilled in the art of metal bonding in the aerospace industry would not look to Tola because (1) Tola is not the field of the applicants' endeavor and (2) Tola is not reasonably pertinent to the particular problem of pre-treating metal for bonding that is the concern of the applicants' invention.

Second, even assuming for the sake of discussion that Tola is appropriate prior art, Tola merely discloses a method for forming a foil/dielectric laminate by applying an epoxy resin to the foil and drying the resin to a thickness of about 0.4 mils. (3:44-48). Tola does not specifically teach the epoxy-based adhesive coating, as recited in claim 16, comprising an epoxy material and a second curative material. Thus, claim 16 is allowable and claims 20-21 are allowable for the at least due to their dependency on claim 16.

Third, even once again assuming that Tola is appropriate prior art, claim 20 is also further patentable over the cited references (Blohowiak and Tola) because the cited references, whether individually or in combination, does not teach a continuous process as recited in claim 20, comprising, "applying a liquid adhesive coating to the *sol-gel* coating on the metal material, wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils." Instead, Tola teaches that its epoxy adhesive is applied to the *dielectric* backing material with a notched roller. (3:40-44). Therefore, claim 20 is further allowable over the cited references (Blohowiak and Tola). Due to this same reason, claim 21 is also further patentable over the cited references (Blohowiak and Tola) because the cited references, whether individually or in combination, does not teach a continuous process as recited in claim 21, comprising, "applying a liquid adhesive coating to the *sol-gel* coating on the metal material, wherein the dry adhesive coating has a thickness of 0.75 mils." (emphasis added).

Shimizu (U.S. 4,374,890)

Shimizu teaches a method and an adhesive-sheet for the reinforcement of metal plates. (1:7-9). The adhesive-sheet comprises a first epoxy resin composition layer and a second epoxy resin composition layer laminated thereon. (1:66-68; 2:1-10). The first epoxy resin composition layer, when cured by heating, has a modulus of elasticity in tension sufficient to increase the stiffness of the metal plate. (2:25-30).

Poutasse (U.S. 5,629,098)

Poutasse teaches an adhesive composition that facilitates the product of laminates used in making printed circuit boards. (1:9-14). The adhesive composition comprising (1) at least one multifunctional epoxy; (2) the composition derived from at least one difunctional epoxy resin and at least one compound represented by the formula $R-(G)_n$. (1:46-50).

Claim 23

Claim 23 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Shimizu, and in further view of Poutasse. Claim 23 depend from claim 16. Accordingly, applicants respectfully incorporate and reassert the argument present above in response to the rejection of claim 16 under 35 U.S.C. §102(a). Moreover, the deficiencies in the teachings of Blohowiak are not remedied by the teachings and disclosures of Poutasse. First, Poutasse is not analogous prior art and therefore cannot be combined with Blohowiak to render claim 23 unpatentable. In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of the applicant's endeavor, or if not, then be reasonably pertinent to the particular problem with which the invention was concerned. *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USP2d 1767 (Fed. Cir. 1993). MPEP §2141.01(a). Applicants' invention is directed toward the pre-bonding surface treatment of metal to facilitate durable bonds for use in aircraft, aerospace and other applications. On the other hand, Poutasse teaches an adhesive composition used for manufacturing laminates in the printed circuit board industry. (1:9-14). Thus, one ordinarily skilled in the art of metal bonding would not look to Poutasse because Poutasse is not the field of the applicants' endeavor and not reasonably pertinent to the particular problem of pre-treating metal for bonding that is the concern of the applicants' invention.

Second, even assuming for the sake of discussion that Poutasse is appropriate prior art, Poutasse, as noted by the Examiner, merely teaches a applying an epoxy adhesive containing acetone to a foil to produce a laminate. (4:48-59). Poutasse does not teach the specific epoxy-based adhesive coating, as recited in claim 16, comprising an epoxy material and a second curative material. Thus, claims 23 is allowable for the at least the same reason that claim 16 is allowable.

Third, even once again assuming for the sake of discussion that Poutasse is appropriate prior art, claim 23 is also further patentable over the cited references (Blohowiak and Poutasse)

because the cited references, whether individually or in combination, does not teach a continuous process as recited in claim 23, comprising, “applying a liquid adhesive coating to the *sol-gel* coating on the metal material, wherein acetone is used as the solvent for the adhesive.” (emphasis added). Instead, Poutasse teaches that acetone is a solvent for an epoxy adhesive that is applied to the *foil* of a circuit board laminate. (1:16-18). Therefore, claim 23 is further allowable over the cited references to Blohowiak and Poutasse.

Claims 24-25

Claims 24-25 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Vaughan, and in further view of Grylls. Claim 25 depend from claim 24. Claim 24 recites a continuous surface preparation process for a metal material comprising: grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320; rinsing the metal material with water to remove the grit; subjecting the metal material to a caustic solution of sodium hydroxide; rinsing the metal material with water to remove the caustic solution of sodium hydroxide; applying a sol-gel coating to the metal material; evaporating the water portion of the sol-gel coating; applying a liquid adhesive coating to the sol-gel coating on the metal material; and evaporating the solvent portion of the adhesive coating.

Applicants respectfully submit that each of the cited reference (Blohowiak, Vaughan and Grylls), does not teach the continuous surface preparation for metal material, comprising, “grit blasting the *metal material* with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a *mesh size of about 180-320*.” (emphasis added).

First, as noted by the Examiner, Blohowiak does teach that 180 grit particles are used for grit blasting, but Blohowiak does not teach grit blasting with a mixture of aluminum oxide in air and water. This deficiency of Blohowiak is not remedied by the teachings of Vaughan. As discussed above, Vaughan merely teaches a method of weld-bonding that includes grit blasting a

titanium alloy with 50 micron alumina. Vaughan also does not teach that the particles of aluminum oxide of the grit blast are mixed with air and water. Furthermore, the deficiencies in the teaching of Blohowiak and Vaughan are not remedied by the teachings of Grylls. As discussed above, Grylls only teaches a method for producing a turbine airfoil that is coated with NiAl that involves grit blasting the *NiAl coating* using alumina particles mixed with compressed air and water vapor.

Therefore, each of the cited references (Blohowiak, Vaughan and Grylls), whether individually or in combination, does not teach every aspect of claim 24. As a result, claim 24 is allowable. Further, because claim 25 depend on claim 24, claim 25 is at least allowable due to the same reason that claim 24 is allowable, as well as due to additional limitations present.

Claims 26-34

Claims 26-34 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Konieczny. Claims 26-34 depend from claim 24. Accordingly, applicants respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320," as recited in claim 24, are not remedied by the teachings of Konieczny. Konieczny only generally teaches that grit blasting may be used to create a roughed surface, but does not specifically teach grit with mesh size of about 180-320. Therefore, applicants respectfully assert that claims 26-34 are allowable for at least the same reasons that claim 24 is allowable, as well as for additional limitations recited in each claim.

Additionally, claim 26 is further allowable because the cited references (Blohowiak, Grylls, Vaughan, and Konieczny), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of

about 280.” Specifically, the deficiencies in the teachings of Blohowiak, Grylls, and Vaughan are not remedied by the teachings of Konieczny. As further discussed above, mere naming or description of the subject matter is insufficient if it cannot be produced without undue experimentation. *Elan Pharm., Inc. v. Mayo Foundation for Medical and Education Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003). MPEP § 2121.01. Thus, Konieczny’s generalized teaching that mesh size of the grit controls the surface roughness is insufficient to disclose, teach or fairly suggest a specific mesh size of about 280, as recited in claim 26. Therefore, claim 26 is further allowable over the cited references.

Claim 35

Claim 35 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Hess. Claim 35 depends from claim 24. Accordingly, applicants respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach “grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320,” as recited in claim 24, are not remedied by the teachings of Hess. As discussed above, Hess merely teaches the use of surfactants in its coating composition to prevent the excessive wear of machinery. Therefore, applicants respectfully assert that claim 35 is allowable at least due to its dependency on claim 24, as well as for additional limitations recited.

Moreover, claim 35 is further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, and Hess), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process, as recited in claim 35, comprising, “applying a sol-gel coating to the metal material, wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant, and wherein the surfactant is *Antarox BL-240*.” (emphasis added). To this end, applicants hereby respectfully

incorporate the arguments present above in response to the rejection of claim 14, and assert the deficiencies in the teachings of Blohowiak, Grylls, Vaughan, and Konieczny are not remedied by the teachings of Montano. Therefore, claim 35 is further allowable over the cited references.

Claim 36

Claim 36 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, Sagiv, and Tomadol. Claim 36 depends from claim 24. Accordingly, applicants respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach “grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320,” as recited in claim 24, is not remedied by the teachings of Konieczny, Sagiv, and Tomadol. First, as discussed above, Konieczny only generally teaches that grit blasting may be used to create a roughed surface, but does not specifically teach grit with mesh size of about 180-320. Second, as further discussed above, Sagiv only teaches that a surfactant may be added to a coating composition to aid in leveling of the composition. Third, the Tomadol Data Sheet, “Tomadol,” merely indicates that Tomadol is a type of ethoxylated linear alcohol nonionic surfactant. Therefore, applicants respectfully assert that claim 36 is allowable at least due to its dependency on claim 24, as well as for additional limitations recited.

Specifically, claim 36 is at least further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, Sagiv, and Tomadol), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, “applying a sol-gel coating to the metal material, wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidioxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant, *and* wherein the surfactant is *Tomadol 91-8*.” (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 15, and assert the

deficiencies in the teachings of Blohowiak, Grylls, and Vaughan are not remedied by the teachings of Sagiv and Tomadol. Therefore, claim 36 is further allowable over the cited references.

Claims 37-38

Claims 37-38 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Montano. Claim 37-38 depend from claim 24. Accordingly, applicants hereby respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320," as recited in claim 24, is not remedied by the teachings of Konieczny and Montano. First, as discussed above, Konieczny only generally teaches that grit blasting may be used to create a roughed surface, but does not specifically teach grit with mesh size of about 180-320. Second, as further discussed above, Montano merely teaches that an epoxy resin composition can be applied to a metal by spray coating, dip coating, and roller coating. Therefore, applicants respectfully that claims 37-38 are allowable at least due to their dependency on claim 24, as well as due to additional limitations recited in each claim.

In particular, claim 37 is at least further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, Konieczny, and Montano), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material, *wherein the liquid adhesive coating is applied in a dip-coating tank.*" (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 18, and assert the deficiencies in the teachings of Blohowiak, Grylls, Vaughan,

and Konieczny are not remedied by the teachings of Montano. Therefore, claim 37 is further allowable over the cited references.

Additionally, claim 38 is also further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, Konieczny, and Montano), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, “applying a liquid adhesive coating to the *sol-gel coating* on the metal material, wherein the liquid adhesive coating is applied *by spraying*.” (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 19, and assert the deficiencies in the teachings of Blohowiak, Grylls, Vaughan, and Konieczny are not remedied by the teachings of Montano. Therefore, claim 38 is further allowable over the cited references.

Claims 39-40

Claims 39-40 are rejected under 35 U.S.C §103(a) as being unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Tola. Claims 39-40 depend from claim 24. Accordingly, applicants hereby respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach “grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320,” as recited in claim 24, is not remedied by the teachings of Tola. As discussed above, Tola merely discloses a method for forming a foil/dielectric laminate by applying an epoxy resin to the foil. Therefore, Applicants respectfully assert that claims 39-40 are allowable at least due to their dependency on claim 24, as well as due to additional limitations in each claim.

Specifically, claim 39 is at least further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, and Tola), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, “applying a liquid adhesive

coating to *the sol-gel coating* on the metal material, and evaporating the solvent portion of the adhesive coating, *wherein the dry adhesive coating has a thickness of 0.1 to 3.0 mils.*” (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 20, and assert the deficiencies in the teachings of Blohowiak, Grylls, and Vaughan are not remedied by the teachings of Tola. Therefore, claim 38 is further allowable over the cited references.

Additionally, claim 40 is also at least further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, and Tola), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, “applying a liquid adhesive coating to the sol-gel coating on the metal material, and evaporating the solvent portion of the adhesive coating, *wherein the dry adhesive coating has a thickness of 0.75 mils.*” (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 21, and assert the deficiencies in the teachings of Blohowiak, Grylls, and Vaughan are not remedied by the teachings of Tola. Therefore, claim 40 is further allowable over the cited references.

Claim 41

Claim 41 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, Konieczny, and Shimizu. Claim 41 depends from claim 24. Accordingly, applicants respectfully incorporate the argument present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach “grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320,” as recited in claim 24, are not remedied by the teachings of Konieczny and Shimizu. First, as discussed above, Konieczny only generally teaches that grit blasting may be used to create a roughed surface, but does not specifically teach grit with mesh size of about 180-320. Second, as further discussed above, Shimizu merely

teaches a method and an adhesive-sheet for the reinforcement of metal plates. Therefore, applicants respectfully assert that claim 41 is allowable at least due to its dependency on claim 24, as well as due to additional limitations recited in the claim.

In particular, claim 41 is at least further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, Konieczny, and Shimizu), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material, wherein the liquid adhesive coating is an epoxy-based adhesive coating including an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating." (emphasis added). Specifically, the deficiencies in the teachings of Blohowiak, Grylls, Vaughan, and Konieczny are not remedied by the teachings of Shimizu. Shimizu does not teach using an epoxy material containing novlac-epoxy. In contrast, the continuous surface preparation process, as recited in claim 41, comprises applying a liquid adhesive that is an epoxy-based adhesive coating including about "10-30% by weight novlac-epoxy." Therefore, claim 41 is allowable because each of the references cited (Blohowiak, Grylls, Vaughan, Konieczny, and Shimizu), whether individually or in combination, does not teach every aspect of claim 41.

Claim 42

Claim 42 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls and in further view of Vaughan, Konieczny, Shimizu, and Poutasse. Claim 42 depends from claim 24. Accordingly, applicants respectfully incorporate the argument present above in response to the rejection of claim 41. Moreover, the failure of Blohowiak, Grylls, Vaughan,

Konieczny, and Shimizu to teach "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320," as recited in claim 24, is not remedied by the teachings of Poutasse. As discussed above, Poutasse merely teaches applying an epoxy adhesive containing acetone to a foil to produce a laminate. Therefore, applicants respectfully assert that claim 42 is allowable at least due to its dependency on claim 24, as well as due to additional limitations recited in the claim.

Specifically, claim 42 is further allowable because each of the cited references (Blohowiak, Grylls, Vaughan, Konieczny, Shimizu, and Poutasse), whether individually or in combination, does not disclose, teach or fairly suggest a continuous process comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material, and evaporating the solvent portion of the adhesive coating, wherein the dry adhesive coating has a thickness of 0.75 mils, *and wherein acetone is used as the solvent for the adhesive.*" (emphasis added). To this end, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 23, and assert the deficiencies in the teachings of Blohowiak, Grylls, Vaughan, Konieczny, and Shimizu are not remedied by the teachings of Poutasse. Therefore, claim 36 is further allowable over the cited references.

Claims 43-44

Claims 43-44 are rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan, and Shimizu. Claim 44 depend from claim 43. Claim 43 recites a continuous surface preparation process for a metal material, said process comprising: grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320; rinsing the metal material with water to remove the grit; subjecting the metal material to a caustic solution of sodium hydroxide wherein the caustic solution of sodium hydroxide has a concentration of about 10-50% by weight sodium hydroxide; rinsing the metal material with water to remove the caustic solution of

sodium hydroxide from the metal material; applying a sol-gel coating to the metal material wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant; evaporating the water portion of the sol-gel coating; applying a liquid adhesive coating to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotrate; and evaporating the solvent portion of the adhesive coating.

Applicants respectfully submit that each of the cited references (Blohowiak, Grylls, Vaughan, and Shimizu), does not teach the continuous surface preparation for metal material as recited in claim 43. First, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 280," as recited in claim 43, is not remedied by the teachings of Shimizu. As discussed above, Shimizu merely teaches a method and an adhesive-sheet for the reinforcement of metal plates. Thus, applicants respectfully assert that the cited references do not disclose, teach or fairly suggest the process of claim 43, comprising, "grit blasting the titanium foil with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320."

Second, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 41, and assert that the cited references do not disclose, teach or fairly suggest the process of claim 43, comprising, "applying a liquid adhesive coating to the sol-gel coating on the metal material wherein the liquid adhesive coating is an epoxy-based adhesive

coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotatate" For these reasons, applicants respectfully submit that claim 43 is allowable over the reference cited to Blohowiak, Grylls, Vaughan, and Shimizu. Furthermore, because claim 44 depends from claim 43, it is also allowable over the references cited at least due to its dependency on claim 43, as well as for additional limitations recited.

Claim 45

Claim 45 is rejected under 35 U.S.C. §103(a) as unpatentable over Blohowiak in view of Grylls, and in further view of Vaughan and Shimizu. Claim 45 recites a continuous surface preparation process for a titanium foil, said process comprising: grit blasting the titanium foil with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 180-320; rinsing the titanium foil with water to remove the grit; subjecting the titanium foil to a caustic solution of sodium hydroxide wherein the caustic solution of sodium hydroxide has a concentration of about 10-50% by weight sodium hydroxide; rinsing the titanium foil with water to remove the caustic solution of sodium hydroxide from the titanium foil; applying a sol-gel coating to the titanium foil wherein the sol-gel is a mixture of a zirconium alkoxide, 3-glycidoxy-propyltrimethoxysilane, glacial acetic acid, and a surfactant; evaporating the water portion of the sol-gel coating; applying a liquid adhesive coating to the sol-gel coating on the titanium foil wherein the liquid adhesive coating is an epoxy-based adhesive coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second

curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate; and evaporating the solvent portion of the adhesive coating.

Applicants respectfully submit that each of the cited references (Blohowiak, Grylls, Vaughan, and Shimizu), does not teach the continuous surface preparation for titanium foil as recited in claim 45. First, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 24. Moreover, the failure of Blohowiak, Grylls, and Vaughan to teach "grit blasting the metal material with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 280," as recited in claim 45, is not remedied by the teachings of Shimizu. As discussed above, Shimizu merely teaches a method and an adhesive-sheet for the reinforcement of metal plates. Thus, applicants respectfully assert that the cited references do not disclose, teach or fairly suggest the process of claim 45, comprising, "grit blasting the titanium foil with a mixture of fine particles of aluminum oxide in air and water, wherein the grit has a mesh size of about 280."

Second, applicants hereby respectfully incorporate the arguments present above in response to the rejection of claim 41, and assert that the cited references do not disclose, teach or fairly suggest the process of claim 45, comprising, "applying a liquid adhesive coating to the sol-gel coating on the titanium foil wherein the liquid adhesive coating is an epoxy-based adhesive coating including: an epoxy material comprising about 3-35% by wt. liquid diglycidylether of bisphenol-A, about 35-60% by wt. solid diglycidylether of bisphenol-A, about 10-30% by wt. novolac-epoxy, and about 5-18% by wt. carboxy-terminated acrylonitrile-butadiene rubber; and a second curative material comprising about 0-100% by wt. 4,4'-diaminodiphenylsulfone, about 0-100% by wt. 3,3'-diaminodiphenylsulfone, and about 0-0.2% by wt. chromium octotate." For these reasons, applicants respectfully submit that claim 45 is allowable over the reference cited to Blohowiak, Grylls, Vaughan, and Shimizu.

Claims 61-62


Claims 61-62 are newly added. Claims 61-62 depend from and apply additional limitations to claim 4. Accordingly, claims 61-62 are allowable for at least the same reasons that make claim 4 allowable, as well for additional limitations recited in each claim.

CONCLUSION

Applicants respectfully submit that pending claims 1-21, 23-45, and 61-62 are now in condition for allowance. If there are any remaining matters that may be handled by telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

Dated: Sept. 11, 2006

By: 
Dale C. Barr
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Enclosures:

Replacement Drawings